

ABSTRACT

A digital communications system employing modulated Walsh functions to convey data across a communications channel. In one embodiment, the system includes a transmitter having a constellation encoder, and a Walsh constellation modulator. The constellation encoder receives a sequence of data words and converts it into a sequence of constellation signal point labels. The modulator receives the sequence of labels, and responsively generates one or more amplitude-modulated Walsh functions which are summed to produce a modulated signal. The modulated signal passes through a communications channel to a receiver. The receiver includes an analog-to-digital converter (ADC) and a demodulation circuit. The ADC oversamples the received signal. The demodulation circuit manipulates the sign of the samples to effectively multiply the received samples with one or more Walsh functions, and sums the resulting values over one symbol interval to determine the modulated amplitude of the corresponding functions.

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